

BEFORE THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA

- - - - -x

NEUROGRAPHIX, a California :
corporation, and WASHINGTON :
RESEARCH FOUNDATION, a :
not-for-profit Washington :
corporation, :

Plaintiffs, : Case Number

vs. : 10-CV-1990 MRP (RZx)

SIEMENS MEDICAL SOLUTIONS :
USA, INC., a Delaware :
corporation, and SIEMENS :
AKTIENGESELLSCHAFT, a German :
corporation, :
Defendants. :

- - - - -x

VIDEOTAPED DEPOSITION OF ROBERT NICK BRYAN, M.D.

Washington, D.C.

Wednesday, September 7, 2011

REPORTED BY:

SARA A. WICK, RPR, CRR

1 Videotaped deposition of ROBERT NICK BRYAN,
2 M.D., called for examination pursuant to notice of
3 deposition, on Wednesday, September 7, 2011, in
4 Washington, D.C., at the offices of Kirkland & Ellis
5 LLP, at 10:05 a.m., before SARA A. WICK, RPR, CRR,
6 and a Notary Public within and for the District of
7 Columbia, when were present on behalf of the
8 respective parties:

9 FREDRICKA UNG, ESQ.

10 Russ August & Kabat

11 12424 Wilshire Boulevard, 12th Floor

12 Los Angeles, California 90025

13 310-826-7474

14 fung@raklaw.com

15 On behalf of Plaintiffs

16
17 SEAN MC ELDOWNNEY, ESQ.

18 CHRISTOPHER NALEVANKO, ESQ.

19 Kirkland & Ellis LLP

20 655 15th Street Northwest

21 Washington, D.C. 20005

22 202-879-5161

23 sean.mceldowney@kirkland.com

24 On behalf of Defendants

25 Also Present: Jonathan Perry, Videographer

1 A Yes.

2 Q You're not taking an image of the entire
3 body; it's only a particular limited location?
4 Correct?

5 A Correct.

6 Q And within the hand, you would target
7 specific fingers, for example; correct?

8 A In this particular case, it's the wrist,
9 actually.

10 Q So within the wrist, you would be able to
11 see where the nerves are; right?

12 A Usually, not.

13 Q And the reason is because of the
14 variability?

15 A Of the inadequacy of the MRI machine to
16 allow one to definitively distinguish the nerve from
17 other tissue.

18 Q And with the brachial plexus -- you have
19 stated in your report that the nerves in the
20 brachial plexus are easier to see; right?

21 A Because they are larger.

22 Q Okay. And if a doctor could not identify
23 where the nerves are, would they be able to rely on
24 a reference, such as an atlas, to identify the
25 nerve?

1 A Atlases are guidelines to where nerves
2 typically are. So they have limited application to
3 a specific patient.

4 Q Have you ever used an atlas before --

5 A Yes.

6 Q -- to help guide you?

7 A Yes.

8 Q And when have you relied on an atlas?

9 A I always rely on an atlas. I have a
10 built-in atlas as a part of being a radiologist. We
11 have a learned atlas that we apply whenever we are
12 looking at an image and attempting to identify
13 structures.

14 Q How often in your practice have you relied
15 on an atlas to help guide you?

16 A You are now speaking of an atlas other
17 than the one that I carry around in my brain?

18 Q Yes.

19 A Probably once every one or two weeks I
20 will refer to an external atlas.

21 Q And would you rely on the atlas for
22 guidance on structure and location of a specific --
23 of a specific nerve or tissue?

24 A Yes. That's generally what an atlas is
25 for.

1 you to see the nerve better than if you were not to
2 use diffusion with fat suppression?

3 MR. MC ELDFOWNEY: Objection; asked and
4 answered.

5 THE WITNESS: So my previous response was
6 to look at the brain, not peripheral nerves.

7 BY MS. UNG:

8 Q Okay.

9 A And one can see the axon fibers in the
10 brain just fine without diffusion imaging at all.
11 We have done that for years.

12 Q Okay. Have you ever used diffusion
13 weighting with fat suppression to view peripheral
14 nerves?

15 A I have not personally.

16 Q Outside of this litigation and prior to
17 your engagement by Kirkland & Ellis to be an expert
18 in this case, have you ever heard of the
19 term "conspicuity"?

20 A Yes.

21 Q And what does it mean to you outside of
22 this litigation?

23 A In the general sense, conspicuity suggests
24 obviousness, that which stands out, that which is
25 easily distinguished from.

1 exercise, I do not recall doing so.

2 Q Have you ever selected ROIs of two
3 different structures for comparison of signal
4 intensity of the two structures?

5 A Yes.

6 Q And how often do you do that?

7 A In clinical practice, very unusually. For
8 research purposes, I have done that a number of
9 times.

10 Q And why would you select ROIs of two
11 different structures for comparison of signal
12 intensity of the two structures?

13 A For research purposes, to quantitate
14 differences in the signal in the two structures.

15 Q And when you were selecting the ROIs for
16 research purposes to quantitate the differences in
17 signal intensity in the two structures, you would
18 select an ROI of, for example, structure A and
19 structure B; correct?

20 A Yes.

21 Q And when selecting an ROI of structure A
22 to determine the signal intensity of that structure,
23 you would take care to select an ROI that only
24 contained that structure and no other structure;
25 correct?

1 To the extent you understand the question
2 and the assumptions, you can answer.

3 MS. UNG: Let me rephrase it.

4 BY MS. UNG:

5 Q Do you understand the question?

6 A I believe so, and it is a very
7 hypothetical question, because such conditions
8 really never exist in practice. But assuming that
9 you have a structure that has homogeneous -- that
10 means the same signal everywhere -- and no noise,
11 which never happens in a measurement, then any ROI
12 placed within that homogeneous signal area would
13 have a similar measurement.

14 Q Now, assuming that you have a structure
15 that is homogeneous -- that means the same signal
16 intensity everywhere -- and the noise does not
17 impact the image, not saying that there is no noise,
18 but that the noise does not impact the image, then
19 any ROI placed within that homogenous signal area
20 would have similar measurements; right?

21 A I think I've answered that question.

22 MR. MC ELDOWNNEY: I'm going to object and
23 say asked and answered, as well as that we're still
24 two assumptions deep on assumptions that Dr. Bryan
25 disagrees with.

1 that the image signal from that voxel may reflect
2 multiple tissues.

3 Q And an example of that would be where the
4 nerve is leaving the plane of the image; correct?

5 MR. MC ELDOWNNEY: Objection; vague.

6 THE WITNESS: Yes, in general, that would
7 be likely associated with a partial volume problem.

8 BY MS. UNG:

9 Q And the partial volume voxel could also
10 represent the edge of two structures; correct?

11 A No. The partial volume problem doesn't
12 represent the edge. It represents the pieces of the
13 two tissues on either side of the edge, unless it's
14 a thick edge.

15 Q If you wanted to select an ROI that
16 consisted only of one structure in the body, say a
17 nerve, for example, one would avoid selecting
18 partial volume pixels -- or I'm sorry,
19 partial-volume voxels; correct?

20 MR. MC ELDOWNNEY: Objection; vague.

21 THE WITNESS: Let me make sure I
22 understand the question. Just reword it or state it
23 again or reread it.

24 BY MS. UNG:

25 Q If you were to select an ROI that

1 consisted of only one structure in the body, say a
2 nerve, for example, you would avoid selecting a
3 partial volume voxel; correct?

4 MR. MC ELDFOWNEY: Objection; vague.

5 THE WITNESS: Under the condition that the
6 structure were homogeneous, which the example you
7 gave would not be the case, nerve, because in the
8 image we were just talking about with the fascicular
9 pattern, that is a nerve, but it is not all the
10 same. So you're asking a very hypothetical
11 question. You need to be specific. What tissue is
12 spatially homogeneous. If there were such a tissue
13 and you put your ROI completely inside of that
14 particular tissue, then you would not have the
15 partial volume effect.

16 BY MS. UNG:

17 Q When you are using the
18 phrase "homogeneous" like you just did now, are you
19 referring to anatomical homogeneity or signal
20 intensity homogeneity?

21 MR. MC ELDFOWNEY: Objection; vague.

22 THE WITNESS: I would need to be clear and
23 explicit whether I'm talking about either anatomic
24 tissue or signal.

25 BY MS. UNG:

1 Q So just now when you were referring to the
2 nerve and you said that it was not homogeneous, were
3 you referring to the anatomy or the signal
4 intensity?

5 A In that particular case, I was referring
6 to both.

7 Q If you have a structure that has
8 homogeneous signal intensity and you wanted to
9 select a region of interest that represents that
10 structure, you would avoid selecting partial-volume
11 voxels; correct?

12 MR. MC ELDOWNNEY: Objection; vague as to
13 "homogeneous signal intensity" and "represents that
14 structure."

15 THE WITNESS: So if there were a
16 theoretical structure that the signal intensity was
17 homogeneous and I wanted to avoid the partial volume
18 problem, then I would attempt to put that ROI away
19 from the edges of that structure.

20 BY MS. UNG:

21 Q If you were to take a cross-section of the
22 nerve, what you would see would be a circular
23 structure; right?

24 MR. MC ELDOWNNEY: Objection; vague as to
25 "the nerve."

1 THE WITNESS: Not necessarily. Some
2 nerves are round. Some nerves are oval. Those
3 would be the two most typical gross shapes.

4 BY MS. UNG:

5 Q And in an image-viewing software, there
6 are built-in tools for selecting regions of
7 interest; right?

8 MR. MC ELDFOWNEY: Objection; vague as
9 to "image-viewing software."

10 THE WITNESS: No. In image-viewing
11 software, there may be tools that can be used to
12 create ROIs.

13 BY MS. UNG:

14 Q And those tools come in different shapes;
15 right? Let me rephrase that.

16 To view an MRI image, you're using a
17 computer with software that allows you to view the
18 image; right?

19 A In current practice, yes.

20 Q Does that software provide tools that
21 allow you to select ROIs?

22 MR. MC ELDFOWNEY: Objection; vague.

23 THE WITNESS: Depending upon the software,
24 but some software does have tools that allows one to
25 create or make ROIs.

1 BY MS. UNG:

2 Q And those tools that allow -- that allows
3 a radiologist to create or make ROIs, for example,
4 are in the shapes of circles or ellipsoids; correct?

5 A Not necessarily. Depending upon the
6 software, they may allow one to make ROIs of simple
7 shapes such as squares or circles, but they may also
8 allow one to make complex-shape freehand ROIs,
9 depending upon the software.

10 Q So if the nerve generally appears as
11 circular or oval, a radiologist could use one of
12 those tools to draw a circular or ellipsoid ROI;
13 correct?

14 MR. MC ELDOWNNEY: Objection; vague as
15 to "one of those tools."

16 THE WITNESS: Depending upon the software,
17 one might be restricted to circles or squares or
18 ovals or the radiologist could draw any shape they
19 wanted.

20 BY MS. UNG:

21 Q So if you have a circular structure, it
22 would be fairly easy to use one of those tools to
23 select a circular ROI; correct?

24 A Let's take out the first part of the
25 clause, the condition if there were a circular

1 structure. The answer to the question is, with much
2 of the software, it is easiest to draw a square or
3 circular ROI.

4 MS. UNG: We can take a break now.

5 VIDEO OPERATOR: The time is 12:25. We
6 are going off the record. This is the end of disk
7 number 1, going on to disk number 2.

8 (Whereupon, at 12:25 p.m., the deposition
9 was recessed, to be reconvened at 1:25 p.m. this
10 same day.)
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

1 that all bright things are nerves, or at least the
2 brightest things are nerves. Again, I think if you
3 go back to column 6, "There exists a large number of
4 pulse sequences capable of controlling or operating
5 a magnetic resonance imaging apparatus and each of
6 which accomplishes some preferred" "optimization.
7 Previously, however, no" "(single) or complex,"
8 leaving out the parentheses, "pulse sequence has
9 been able to increase the relative signal intensity
10 of" a "nerve so that it is brighter than all other
11 tissues in the body or limb cross section.
12 Surprisingly, the inventors have discovered that
13 there are certain novel ways of assembling complex
14 pulse sequences, wherein even though the simple
15 components of the sequence decrease the
16 signal-to-noise ratio of nerve or decrease the
17 signal strength of nerve relative to other tissues,
18 the fully assembled complex sequence actually
19 results in the nerve signal being more intense than
20 any other tissue. In this fashion, the image
21 conspicuity of nerve is greatly increased."

22 So the way I read and interpret that is
23 that if I had performed an image with this
24 methodology, which I don't understand and I don't
25 think the patent describes, and I get an image, the

1 the whole thing manual. But in those such as most
2 of those in figure 1, the software defined the ROI
3 as a circle, and I had defined what the software
4 would set as the diameter.

5 Q Is it fair to say, then, where the ROI is
6 circular in figures 1 through 11, that you manually
7 placed the ROI there using the software to set the
8 diameter?

9 MR. MC ELDOWNNEY: Objection; misstates the
10 testimony.

11 THE WITNESS: I manually positioned the
12 software -- positioned the ROI. The software set
13 the -- the fact that it was a circle and a diameter
14 in some cases.

15 BY MS. UNG:

16 Q When selecting the ROIs in figure 1 for
17 both nerve and nonneural tissue, did you take any
18 care to avoid selecting partial-volume voxels?

19 MR. MC ELDOWNNEY: Objection; vague as
20 to "take any care."

21 THE WITNESS: The attempt to avoid the
22 partial volume problem, I did attempt to address as
23 best I could, having the limited information of this
24 one slice.

25 BY MS. UNG:

1 Q Is that --

2 A And the spatial resolution of the image.

3 Q And you attempted to avoid the
4 partial-volume voxels or problem, as you stated it,
5 in not just figure 1 but in figures 2, 3, 4 through
6 11; right?

7 A I attempted to avoid or minimize the
8 partial volume problem, taking into consideration
9 the limitations of the spatial resolution of the
10 scans and the specific nature of the ROI that I was
11 drawing.

12 Q What do you mean by the specific nature of
13 the ROI that you were drawing?

14 A So in figure 1, these ROIs were, as I
15 recall, intended to have a similar diameter, which
16 was set by the machine. And given that, I have to
17 try to position that size ROI as best I can on the
18 same structure. In some cases that is difficult to
19 do, depending upon the size of the structure versus
20 the size of the ROI.

21 Q Do you remember the diameter that you had
22 set the software to in selecting the ROIs in figure
23 1?

24 A The -- it's reflected in the area figure
25 that you see out there where the quantitative

1 Q And what is the cause for that
2 variability?

3 A It's like a motor thing on the monitor.
4 The way this software does it, you put a dot where
5 you want to start the circle, and then you move the
6 mouse, and the circle gets bigger as you drag the
7 mouse. And you can see the area number. And so
8 it's a matter of my looking at the image, placing
9 the dot where I think I want the circle to begin,
10 dragging the mouse, and watching that digital
11 counter until I get to about 0.88 or whatever I was
12 shooting for here, and that looks about like what it
13 was.

14 Q Did you consider using a smaller diameter
15 for the ROIs?

16 A Yes. I considered using a smaller
17 diameter. I considered using a bigger diameter.
18 There was nothing to guide me from the patent, and
19 so I used my best judgment of what would an
20 appropriate-sized ROI be for structures of the size
21 that we are discussing and the spatial resolution of
22 the image.

23 Q Where it indicates "mean," that refers to
24 the mean signal intensity of that particular ROI;
25 right?

1 A Yes.

2 Q And that was generated by the software?

3 A Yes.

4 Q In figure 2, did you select any ROIs of
5 the non-neural tissue that is adjacent to a nerve?

6 MR. MC ELDOWNEY: Objection; vague as
7 to "adjacent."

8 THE WITNESS: I don't know if I did or
9 not, because other than, perhaps, the most obvious
10 nerves on this image, which are the brachial plexus,
11 I don't know where other nerves are. So it is
12 entirely possible that there are ROIs on here that
13 are immediately adjacent to nerves, but I don't know
14 where those nerves are.

15 BY MS. UNG:

16 Q But you did not select any ROI of
17 nonneural tissue that is adjacent to an ROI of
18 neural tissue; correct?

19 MR. MC ELDOWNEY: Objection; asked and
20 answered.

21 THE WITNESS: And I don't know that,
22 because I don't know where the nerves are on this
23 image. I can't tell if some of these ROIs are
24 adjacent or not adjacent to nerves.

25 BY MS. UNG:

1 Q Did you use any of the methods discussed
2 in any of those articles when you were selecting the
3 ROIs for Exhibit 41?

4 A In terms of specifically using the same
5 ROI methodology as any of those papers, the answer
6 is no.

7 Q And why didn't you select -- let me
8 rephrase that.

9 Why didn't you choose to use one of the
10 methodologies or any of the methodologies discussed
11 in those journal articles?


12 A In those journal articles, the ROI
13 methodology is explicit for the task of those
14 particular projects. Those tasks are not comparable
15 to the tasks we're talking about here. Therefore,
16 the ROI methodology that they described, in my
17 opinion, would not transfer, be appropriate for this
18 methodology, and the patent didn't give me any
19 alternative specific ROI methodology. So I used
20 some, if you will, ordinary skill practice to come
21 up with arbitrary ROIs.

22 Q Does the '360 patent tell you how far to
23 look for the adjacent nonneural tissue from the
24 neural tissue?

25 MR. MC ELDFOWNEY: Objection; vague.

CERTIFICATE OF NOTARY PUBLIC & REPORTER

I, SARA WICK, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn; that the testimony of said witness was taken in shorthand and thereafter reduced to typewriting by me or under my direction; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.



Notary Public in and for the
District of Columbia

Commission Expires: NOVEMBER 14, 2012